



WHITE-RODGERS

1F83-51

Non-Programmable Electronic
Digital Multi-Stage Thermostat
**INSTALLATION AND
OPERATION INSTRUCTIONS**

Operator: Save these instructions for future use!

**FAILURE TO READ AND FOLLOW ALL INSTRUCTIONS CAREFULLY
BEFORE INSTALLING OR OPERATING THIS CONTROL COULD CAUSE
PERSONAL INJURY AND/OR PROPERTY DAMAGE.**

DESCRIPTION

Your new White-Rodgers Digital Multi-stage Thermostat uses the technology of a solid-state microcomputer to provide precise temperature control.

Features:

- Simultaneous heat and cool program storage
- Optional **C** terminal (dual power option)

- LCD continuously displays room temperature
- °F/°C convertibility
- Temperature range 45° to 90°F
- Two-stage heat/two-stage cool

PRECAUTIONS

This thermostat is intended for use with a 24-volt system; do not use this thermostat with a millivolt or line voltage system. If in doubt about whether your wiring is millivolt, line, or low voltage, have it inspected by a qualified heating and air conditioning contractor or electrician.

Do not exceed the specification ratings.

All wiring must conform to local and national electrical codes and ordinances.

This control is a precision instrument, and should be handled carefully. Rough handling or distorting components could cause the control to malfunction.

⚠ CAUTION

To prevent electrical shock and/or equipment damage, disconnect electric power to system at main fuse or circuit breaker box until installation is complete.

⚠ WARNING

Do not use on circuits exceeding specified voltage. Higher voltage will damage control and could cause shock or fire hazard.

Do not short out terminals on gas valve or primary control to test. Short or incorrect wiring will damage thermostat and could cause personal injury and/or property damage.

SPECIFICATIONS

ELECTRICAL DATA

Electrical Rating:

- 20 to 30 VAC 50/60 Hz. or D.C.
- 0.05 to 1.5 Amps (Load per terminal)
- 1.5 Amps Maximum Total Load** (All terminals combined)

THERMAL DATA

Setpoint Temperature Range:

45°F to 90°F (7°C to 32°C)

Operating Ambient Temperature Range:

32°F to 105°F

Operating Humidity Range:

0 to 90% RH (non-condensing)

Shipping Temperature Range:

-40°F to 150°F

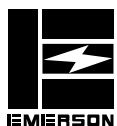
APPLICATIONS

For use with:

- Heat/cool systems with up to two stages heat, two stages cool

DO NOT USE WITH:

- Millivolt systems
- Systems exceeding 30 VAC and 1.5 amps
- 3-wire zoned hydronic heating systems



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INSTALLATION

REMOVE OLD THERMOSTAT

1. Shut off electricity at the main fuse box until installation is complete. Ensure that electrical power is disconnected.
2. Remove the front cover of the old thermostat. **With wires still attached**, remove wall plate from the wall. If the old thermostat has a wall mounting plate, remove the thermostat and the wall mounting plate as an assembly.
3. **Identify each wire attached to the old thermostat using the labels enclosed with the new thermostat.**
4. Disconnect the wires from old thermostat one at a time. **DO NOT LET WIRES FALL BACK INTO THE WALL.**
5. Install new thermostat using the following procedures.

PRE-INSTALLATION SET-UP

1. Remove the packing material from the thermostat.
2. This thermostat is configured from the factory to operate a heat/cool, fossil fuel (gas, oil, etc.), forced air system with up to 2 stages of heat and 2 stages of cool. It is configured correctly for any system that DOES NOT require the thermostat to energize the fan on a call for heat.

If your system is an electric heat or heat-pump system that REQUIRES the thermostat to turn on the fan on a call for heat, locate the **GAS/ELECTRIC switch** on the back of the thermostat (see fig. 1) and switch it to the **ELECTRIC** position. This will allow the thermostat to energize the fan immediately on a call for heat. If you are unsure if the heating/cooling system requires the thermostat to control the fan, contact a qualified heating and air conditioning service person.

3. A jumper is located on the back of the thermostat, so that you may customize the thermostat to meet your individual preference (see fig. 1). In most applications, the factory jumper setting provides the most comfortable and convenient thermostat operation.

Jumper wire **W901** determines how fast the system cycles on and off, based on temperature change. As shipped from the factory, the thermostat will maintain a very consistent room temperature, usually within 1°F of the thermostat setting. To achieve a slower on and off cycle, providing a slightly wider temperature span, cut and separate jumper wire **W901**.

BATTERY LOCATION

This thermostat requires 3 "AA" alkaline batteries to operate. Batteries are installed in the thermostat at the factory with a battery tag to prevent power drainage. **You must remove the battery tag to engage the batteries** and provide power to the thermostat. After batteries are engaged, thermostat display and features may be viewed before installing thermostat.

If **LOW BATTERY** is displayed, the batteries are low and should be replaced with fresh "AA" Energizer® alkaline batteries. To replace batteries, install the batteries along the top of the base (see fig. 2). The batteries must be installed with the positive (+) ends to the left.

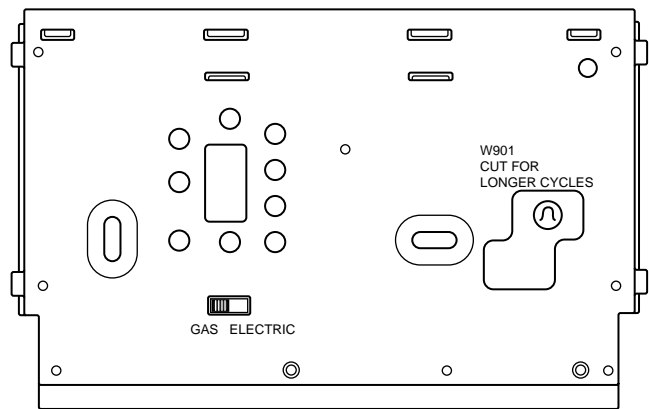


Figure 1. Back of thermostat base

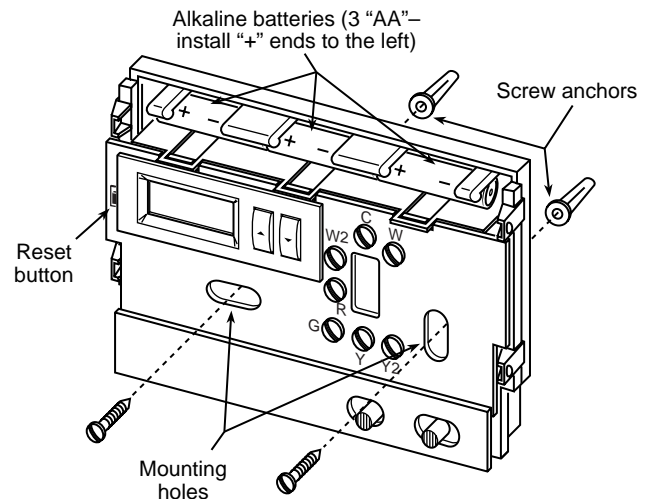


Figure 2. Thermostat base

INSTALLING THE THERMOSTAT

1. Gently remove the cover by pulling it straight off the base. Forcing or prying on the unit may cause damage to the unit.
2. Pull wires through the hole in the thermostat base and place the base over the hole in the wall. Mark mounting hole locations on the wall using the base as a template.
3. Move the base out of the way. Drill mounting holes.
4. Fasten the base loosely to the wall, as shown in fig. 2, using two mounting screws. Place a level against the bottom of the base, adjust until level, and then tighten the screws. (Leveling is for appearance only and will not affect thermostat operation.) If you are using existing mounting holes, or if the holes drilled are too large and do not allow you to tighten the base snugly, use plastic screw anchors to secure the base.
5. Check that the **SYSTEM** switch is in the **OFF** position. Connect the wires beneath the terminal screws on the base using the appropriate wiring diagram (see figs. 3 through 5).
6. Push excess wire into wall and plug hole with a fire-resistant material (such as fiberglass insulation) to prevent drafts from affecting thermostat operation.

(Instructions continue on page 4.)

NOTE

The following wiring diagrams show **typical** terminal identification and wiring. For proper installation, refer to the original manufacturer's instructions.

NOTE

Relay contacts shown are thermostatically operated.

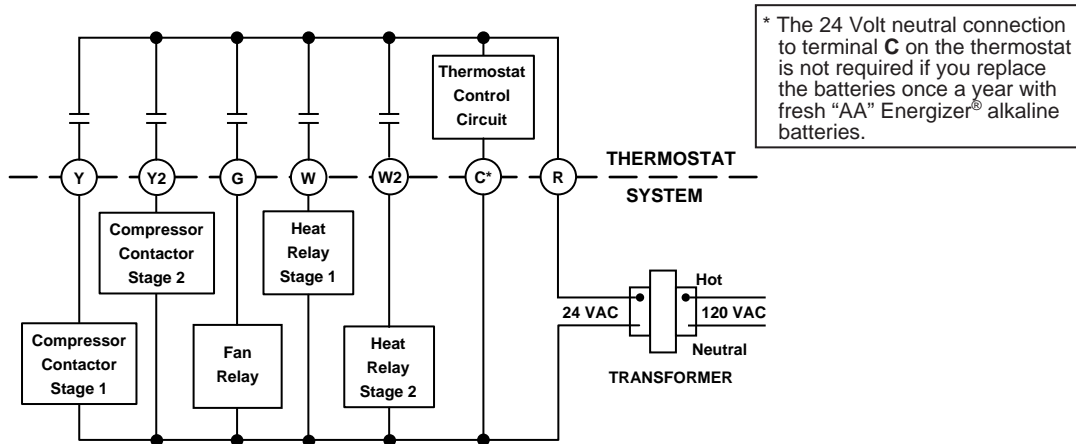


Figure 3. Typical wiring diagram for single transformer systems

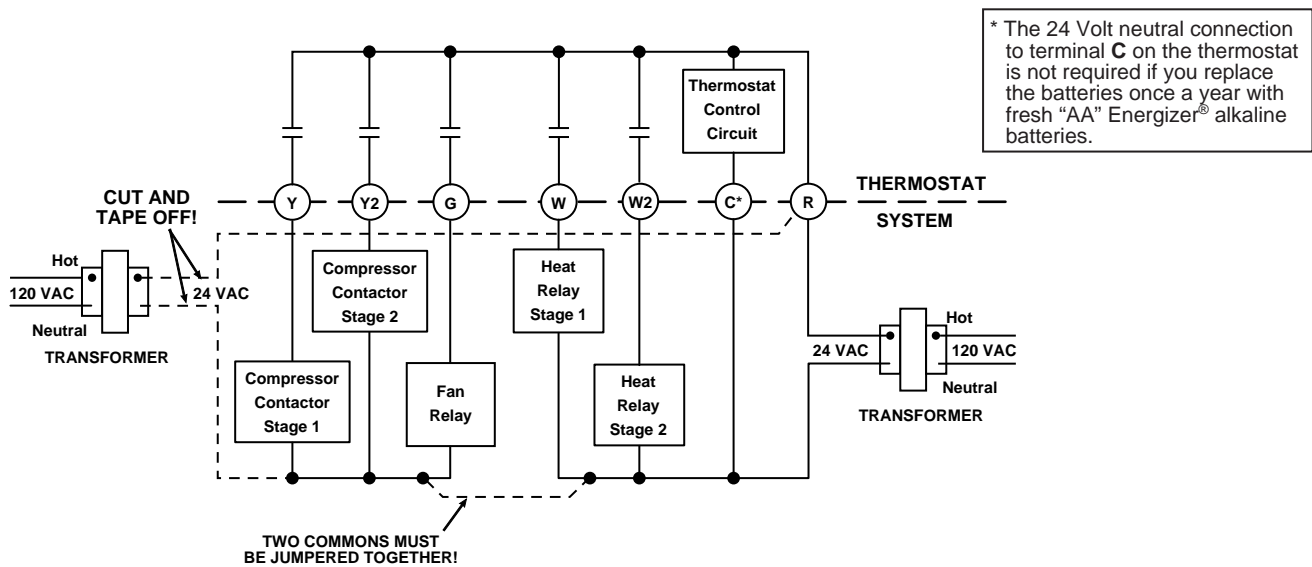


Figure 4. Typical wiring diagram for two-transformer systems with NO safety circuits

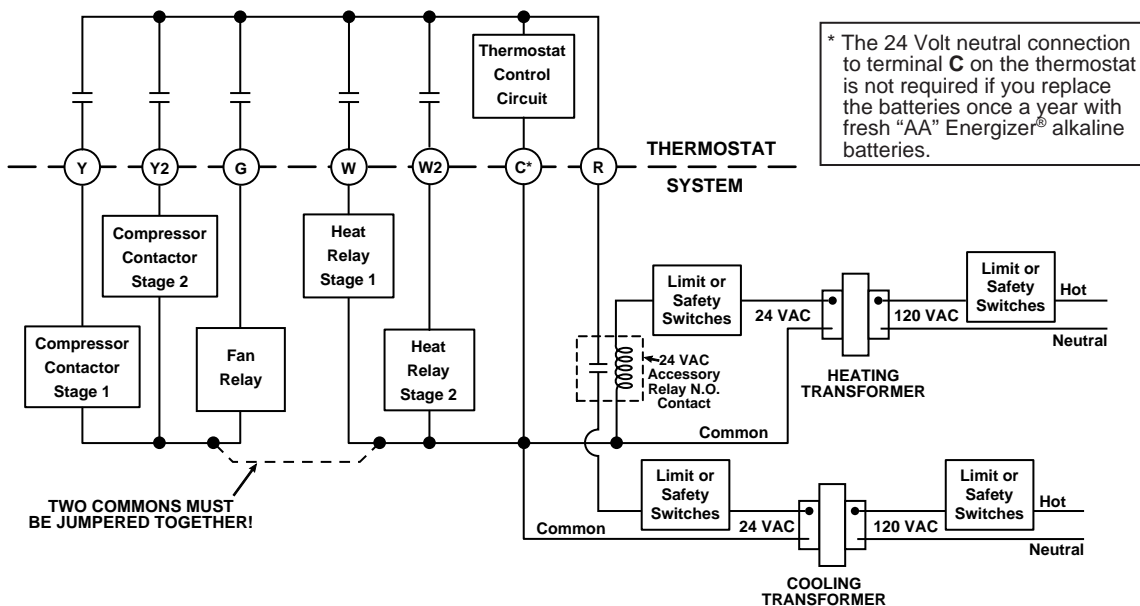


Figure 5. Typical wiring diagram for two-transformer systems with safety circuits in BOTH systems

CHECK THERMOSTAT OPERATION



NOTE

If at any time during testing, your system does not operate properly, contact a qualified serviceperson.

Fan Operation

1. Turn on power to the system.
2. Move SYSTEM switch to **OFF** position.
3. Move FAN switch to **ON**. The blower should begin to operate.
4. Move FAN switch to **AUTO** position. The blower should stop within a short period of time.


Heating System

1. Move SYSTEM switch to **HEAT** position
2. Press  to adjust thermostat setting to 90° and **hold for five seconds**. Both stages of the heating system should begin to operate within five seconds.
3. Press  to adjust temperature setting below room temperature. The auxiliary heating system will stop immediately and the first stage will stop within three to four minutes.


Cooling System

CAUTION

To prevent compressor and/or property damage, if the outdoor temperature is below 50°F, DO NOT operate the cooling system.

1. Move SYSTEM switch to **COOL** position.
2. Press  to adjust thermostat setting to 45° and **hold for five seconds**. The blower should come on immediately on high speed, followed by cold air circulation. Both stages of the cooling system should begin to operate (if you have a two-stage cooling system).



If the fan is running but the compressor is not running and the display has **CL** flashing, the compressor lockout feature is operating (see **Lockout Bypass Option** to temporarily override the compressor lockout feature during testing).

3. Press  to adjust temperature setting above room temperature. The cooling system should stop operating.

LOCKOUT BYPASS OPTION

FOR QUALIFIED SERVICE TECHNICIANS' USE ONLY. OPERATORS SHOULD NOT USE THIS FEATURE DUE TO POSSIBILITY OF EQUIPMENT OR PROPERTY DAMAGE, OR PERSONAL INJURY.



COMPRESSOR SHORT TERM CYCLE PROTECTION

During normal operation, this thermostat has a built-in short term (5-minute) time delay. During this 5-minute period, the thermostat will lock out the compressor to allow head pressure to stabilize. If you want to override this feature while testing thermostat operation, simply press  and  buttons at the same time with the SYSTEM switch in the OFF position.

DO NOT USE THE LOCKOUT BYPASS OPTION UNLESS THE COMPRESSOR OIL HEATERS HAVE BEEN OPERATIONAL FOR 6 HOURS AND THE SYSTEM HAS NOT BEEN OPERATIONAL FOR AT LEAST 5 MINUTES.

Before you begin using your thermostat, you should be familiar with its features and with the display and the location and operation of the thermostat buttons. Your thermostat consists of two parts: the **thermostat cover** and the **base**. To remove the cover, gently pull it straight out from the base. To replace the cover, line up the cover with the base and press gently until the cover snaps onto the base.

THE THERMOSTAT BASE

Other than  and , the following buttons and switches are located behind the door on the bottom of the thermostat cover (see fig. 6). Pull the door down to open it.

The Thermostat Buttons and Switches



- ① (Red arrow) Raises temperature setting.
- ② (Blue arrow) Lowers temperature setting.
- ③ FAN switch (**ON**, **AUTO**).
- ④ SYSTEM switch (**COOL**, **OFF**, **HEAT**).

The Display

- ⑤ **HT** is displayed when the SYSTEM switch is in the HEAT position. When calling for the first stage of heat, **HT1** will display. When calling for the second stage of heat, **HT1+2** will display. **CL** is displayed (non-flashing) when the SYSTEM switch is in the COOL position. When calling for the first stage of cool, **CL1** will display. When calling for the second stage of cool, **CL1+2** will display. **CL** is displayed (flashing) when the compressor is in lockout mode.
- ⑥ Displays current temperature.
- ⑦ **LOW BATTERY** is displayed when the 3 "AA" batteries are low and should be replaced. Nothing else will be displayed.
- ⑧ Displays current setpoint temperature. This is blank when SYSTEM switch is in the OFF position.

OPERATING FEATURES

Now that you are familiar with the thermostat buttons and display, read the following information to learn about the many features of the thermostat.

- **TEMPERATURE SETPOINT** — Press  or  until the display shows the temperature you want.
- **SIMULTANEOUS HEATING/COOLING STORAGE** — You can enter both your heating and cooling setpoints at the same time. There is no need to reset the thermostat at the beginning of each season.
- **LOW BATTERY INDICATOR** — If the 3 "AA" alkaline batteries are low and should be replaced, the display will be blank except for the word **LOW BATTERY**. When the batteries are low, pressing any button will cause the display to operate for ten seconds. After ten seconds, the display will be blank except for the word **LOW BATTERY**. When the duration of a low battery condition exceeds four weeks, the setpoint is altered by 10 degrees to signal that the batteries must be replaced.

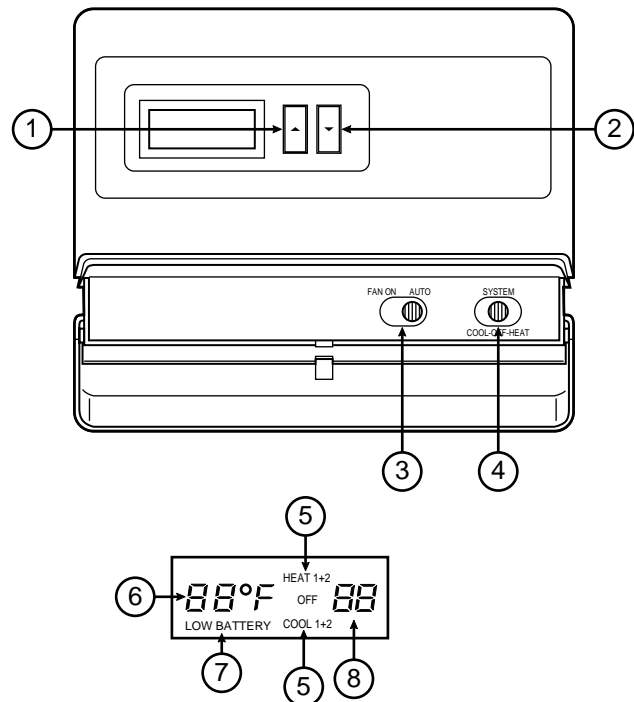








Figure 6. Thermostat display, buttons, and switches

- **°F/°C CONVERTIBILITY**— When the thermostat is in the temperature display adjustment mode, or 30 seconds after power up, pressing  and  at the same time will switch the LCD temperature display between Fahrenheit and Celsius.
- **TEMPERATURE DISPLAY ADJUSTMENT** — Your new thermostat has been accurately set in our factory. However, if you wish, you may adjust your new thermostat temperature display to match your old thermostat. This can be accomplished (within a $\pm 4^\circ\text{F}$ range) as follows:
 1. Move the SYSTEM switch to **OFF** position.
 2. Press and hold  and move the SYSTEM switch to **HEAT** or **COOL**. Release .
 3. Press  or  to adjust the displayed temperature to your desired setting. After setting your desired temperature, do not press any buttons for ten seconds. The thermostat will continue operating at the changed temperature setting.
 4. Pressing the hardware RESET button (see Fig. 2) will return the offset to zero.

TROUBLESHOOTING

If your thermostat's display is frozen or displaying incorrectly, the thermostat may have been affected by static discharge or voltage variations. If this happens, press the RESET button (see fig. 2, page 2 for the location of the button). If pressing the RESET button does not correct the problem, contact a qualified service technician.

For optimum performance, we recommend replacing batteries once a year with fresh "AA" Energizer® alkaline batteries.

